

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-35 (Canceled).

Claim 36 (Currently Amended): An image forming apparatus which repeats image create/transfer processing, which is serial processing of forming a toner image on a photosensitive member while rotating said photosensitive member and a transfer medium in a sub scanning direction and thereafter transferring said toner image onto said transfer medium, for a plurality of toner colors which are different from each other, to thereby lay toner images in said respective toner colors over each other on said transfer medium and accordingly form a color image,

characterized in correcting transfer start positions of toner images in at least one or more toner colors out of said plurality of toner colors based on a registration control amount which is necessary to correct relative registration deviations among toner images on said transfer medium, and comprising:

abutting means which temporarily contacts said transfer medium while said image create/transfer processing is repeated; and

control means which corrects transfer start positions of toner images, using as said registration control amount a control amount which is necessary to correct relative registration deviations among toner images on said transfer medium which are created as said abutting means contacts and moves away from said transfer medium, said control means executes registration control amount establish processing before a color image is formed, to thereby identify said registration control amount

wherein after forming a color image at least once or more times based on said registration control amount, said control means executes registration control amount correction which is different from said registration control amount establish processing to correct said registration control amount.

Claim 37 (Currently Amended): An image forming apparatus in accordance with Claim 36, wherein said registration control amount correction comprises measurement processing in which a period which is necessary for said transfer medium to rotate one round rotation is measured a plurality of times during creation of a color image, and correction processing in which said registration control amount is corrected based on the amount of a difference between said periods.

Claim 38 (Original): An image forming apparatus in accordance with Claim 37, wherein said control means measures, as said plurality of periods, periods which correspond to primary transfer of toner images in said respective toner colors.

Claim 39 (Original): An image forming apparatus in accordance with Claim 37, wherein said control means executes said measurement processing after said transfer medium rotates a predetermined number of times since started rotating.

Claim 40 (Original): An image forming apparatus in accordance with Claim 37, wherein said control means converts an image create instruction supplied from outside said apparatus into one or more than one jobs which are proper to operations in respective portions of said apparatus, and sequentially controls said respective portions of said apparatus in accordance with said jobs, and

 said correction processing is executed during breaks between said jobs.

Claim 41 (Original): An image forming apparatus in accordance with Claim 37, wherein said control means timely executes density adjustment processing and accordingly adjusts image densities of toner images to a target density, and

said correction processing is executed concurrently with said density adjustment processing.

Claim 42 (Original): An image forming apparatus in accordance with Claim 36, further comprising memory means which stores an initial registration control amount which is identified in advance,

wherein for the purpose of creating a color image prior to execution of said registration control amount correction, said control means reads said initial registration control amount which is stored in said memory means and accordingly correct transfer start positions for toner images in said respective toner colors based on said initial registration control amount.

Claim 43 (Original): An image forming apparatus in accordance with Claim 36, wherein said control means executes said registration control amount establish processing to find an initial registration control amount before said registration control amount correction and before creation of a color image, and for the purpose of creating a color image prior to execution of said registration control amount correction, said control means corrects transfer start positions for toner images in said respective toner colors based on said initial registration control amount.

Claim 44 (Original): An image forming apparatus in accordance with Claim 36, wherein said control means executes said registration control amount establish processing to find said initial registration control amount, after turning on of a power source of said apparatus but before the first color image is formed.

Claim 45 (Currently Amended): An image forming apparatus in accordance with Claim 36, wherein said registration control amount establish processing is to allow said transfer medium to rotate more than one time, cause said abutting means to contact and move away from said transfer medium which is in rotation, measure a period which is necessary for

said transfer medium to rotate one round rotation a plurality of times, and find said initial registration control amount based on the amount of a difference between said periods.

Claim 46 (Original): An image forming apparatus in accordance with Claim 36, wherein said control means determines timing to execute said registration control amount correction based on an index value which represents an operation state of said apparatus.

Claim 47 (Currently Amended): An image forming apparatus in accordance with Claim 36, wherein said registration control amount correction comprises:

measurement processing in which a period which is necessary for said transfer medium to rotate one round rotation is measured a plurality of times during creation of a color image;

intermediate calculation processing in which an intermediate registration control amount is identified based on the amount of a difference between said periods; and

correction processing in which said initial registration control amount and said intermediate registration control amount are corrected by weighting based on an index value which represents an operation state of said apparatus as it is before execution of said registration control amount correction since establishment of said initial registration control amount, to thereby determine said registration control amount.

Claim 48 (Original): An image forming apparatus in accordance with Claim 47, wherein said index value is the number of times color images are formed.

Claim 49 (Original): An image forming apparatus in accordance with Claim 47, wherein said index value is the amount of rotation of said photosensitive member or said transfer medium.

Claim 50 (Original): An image forming apparatus in accordance with Claim 47, wherein said index value is the number of sheets on which images are formed.

Claim 51 (Currently Amended): An image forming apparatus in accordance with Claim 36, wherein said registration control amount correction comprises:

measurement processing in which a period which is necessary for said transfer medium to rotate one round rotation is measured a plurality of times during creation of a color image;

intermediate calculation processing in which an intermediate registration control amount is identified based on the amount of a difference between said periods; and

correction processing in which said intermediate registration control amount is set as said registration control amount when an index value, which represents an operation state of said apparatus as it is before execution of said registration control amount correction since establishment of said initial registration control amount, becomes equal to or larger than a predetermined threshold value.

Claim 52 (Original): An image forming apparatus in accordance with Claim 51, wherein said index value is the number of times color images are formed.

Claim 53 (Original): An image forming apparatus in accordance with Claim 51, wherein said index value is the amount of rotation of said photosensitive member or said transfer medium.

Claim 54 (Original): An image forming apparatus in accordance with Claim 51, wherein said index value is the number of sheets on which images are formed.

Claim 55 (Currently Amended): An image forming apparatus in accordance with Claim 36, further comprising detecting means ~~which~~ which detects at least one of a temperature and a humidity level inside said apparatus,

wherein said control means determines timing to execute said registration control amount correction based on a result of the detection by said detecting means.

Claims 56-72 (Canceled)

Claim 73 (Currently Amended): An image forming apparatus which repeats image create/transfer processing, which is serial processing of forming a toner image on a photosensitive member while rotating said photosensitive member and a transfer medium in a sub scanning direction and thereafter transferring said toner image onto said transfer medium, for a plurality of toner colors which are different from each other, to thereby lay toner images in said respective toner colors over each other on said transfer medium and accordingly form a color image,

characterized in correcting transfer start positions of toner images in at least one or more toner colors out of said plurality of toner colors based on a registration control amount which is necessary to correct relative registration deviations among toner images on said transfer medium, and comprising:

abutting means which temporarily contacts said transfer medium while said image create/transfer processing is repeated;

memory means which stores data; and

control means which executes said registration control amount establish processing before creating a color image to thereby identify, based on data which are acquired during said registration control amount establish processing, a registration control amount which is necessary to correct relative registration deviations among toner images on said transfer medium which are created as said abutting means contacts and moves away from said transfer medium,

said control means calculating a registration control amount based on data stored in said memory means without re-executing said registration control amount establish processing, when an interruption of said registration control amount establish processing is removed, to thereby correct transfer start positions for toner images in said respective toner colors in accordance with said registration control amount.

Claim 74 (Original): An image forming apparatus in accordance with Claim 73, wherein said memory means further stores a recovery control amount, and when the interruption of said registration control amount establish processing is removed, if the number of acquired data pieces at the time of the interruption is equal to or smaller than a predetermined number, said control means reads said recovery control amount as a registration control amount from said memory means without re-executing said registration control amount establish processing, and corrects transfer start positions for toner images in said respective toner colors in accordance with said registration control amount.

Claim 75 (Original): An image forming apparatus in accordance with Claim 74, wherein every time said control means executes said registration control amount establish processing and obtains a registration control amount, said control means updates said recovery control amount stored in said memory means into the newly obtained registration control amount.

Claim 76 (Original): An image forming apparatus in accordance with Claim 74, wherein a registration control amount which is obtained by executing said registration control amount establish processing at predetermined timing is stored in said memory means as said recovery control amount.

Claim 77 (Original): An image forming apparatus in accordance with Claim 74, wherein said recovery control amount is fixedly stored in said memory means.

Claim 78 (Original): An image forming apparatus in accordance with Claim 74, wherein said control means executes said registration control amount correction after forming a color image at least once or more times based on said registration control amount, and corrects said registration control amount.

Claim 79 (Original): An image forming apparatus in accordance with Claim 74, wherein said control means executes said registration control amount correction after forming

a color image at least once or more times based on said registration control amount, to thereby correct said registration control amount and update said recovery control amount stored in said memory means into the newly corrected registration control amount.

Claim 80 (Currently Amended): An image forming apparatus which repeats image create/transfer processing, which is serial processing of forming a toner image on a photosensitive member while rotating said photosensitive member and a transfer medium in a sub scanning direction and thereafter transferring said toner image onto said transfer medium, for a plurality of toner colors which are different from each other, to thereby lay toner images in said respective toner colors over each other on said transfer medium and accordingly form a color image,

characterized in correcting transfer start positions of toner images in at least one or more toner colors out of said plurality of toner colors based on a registration control amount which is necessary to correct relative registration deviations among toner images on said transfer medium, and comprising:

abutting means which temporarily contacts said transfer medium while said image create/transfer processing is repeated;

control means which corrects transfer start positions of toner images, using as said registration control amount a control amount which is necessary to correct relative registration deviations among toner images on said transfer medium which are created as said abutting means contacts and moves away from said transfer medium, said control means executes registration control amount establish processing before a color image is formed, to thereby identify said registration control amount; and

memory means which stores a recovery control amount,

wherein, when the an interruption of said registration control amount establish processing is removed, said control means reads said recovery control amount as a

registration control amount from said memory means without re-executing said registration control amount establish processing, and corrects transfer start positions for toner images in said respective toner colors in accordance with said registration control amount.

Claim 81 (Original): An image forming apparatus in accordance with Claim 80, wherein every time said control means executes said registration control amount establish processing and obtains a registration control amount, said control means updates said recovery control amount stored in said memory means into the newly obtained registration control amount.

Claim 82 (Original): An image forming apparatus in accordance with Claim 80, wherein a registration control amount which is obtained by executing said registration control amount establish processing at predetermined timing is stored in said memory means as said recovery control amount.

Claim 83 (Original): An image forming apparatus in accordance with Claim 80, wherein said recovery control amount is fixedly stored in advance in said memory means.

Claim 84 (Original): An image forming apparatus in accordance with Claim 80, wherein said control means executes said registration control amount correction after forming a color image at least once or more times based on said registration control amount, to thereby correct said registration control amount.

Claim 85 (Original): An image forming apparatus in accordance with Claim 80, wherein said control means executes said registration control amount correction after forming a color image at least once or more times based on said registration control amount, to thereby correct said registration control amount and update said recovery control amount stored in said memory means into the newly corrected registration control amount.

Claims 86-94 (Canceled).

Claim 95 (Currently Amended): An image forming method which repeats image create/transfer processing, which is serial processing of forming a toner image on a photosensitive member while rotating said photosensitive member and a transfer medium in a sub scanning direction and thereafter transferring said toner image onto said transfer medium, for a plurality of toner colors which are different from each other, to thereby lay toner images in said respective toner colors over each other on said transfer medium and accordingly form a color image, said image forming method comprising:

a first step of executing registration control amount establish processing, to thereby identifying a registration control amount which is necessary to correct relative registration deviations among toner images on said transfer medium;

a second step of correcting transfer start positions of toner images in at least one or more toner colors out of said plurality of toner colors based on said registration control amount; and

a third step of executing registration control amount correction which is different from said registration control amount establish processing, to thereby correcting said registration control amount after forming a color image at least once or more times based on said registration control amount.

Claims 96-98 (Canceled).

Claim 99 (Currently Amended): An image forming method which repeats image create/transfer processing, which is serial processing of forming a toner image on a photosensitive member while rotating said photosensitive member and a transfer medium in a sub scanning direction and thereafter transferring said toner image onto said transfer medium, for a plurality of toner colors which are different from each other, to thereby lay toner images in said respective toner colors over each other on said transfer medium and accordingly form a color image, said image forming method comprising:

a first step of identifying a registration control amount which is necessary to correct relative registration deviations among toner images on said transfer medium;

a second step of correcting transfer start positions of toner images in at least one or more toner colors out of said plurality of toner colors based on said registration control amount;

said first step is a registration control amount establish step of identifying a registration control amount which is necessary to correct relative registration deviations among toner images on said transfer medium which are created as abutting means temporarily contacts said transfer medium while said image create/transfer processing is repeated;

a third step of storing a recovery control amount in memory means; and

a fourth step of, as an interruption of said registration control amount establish step is removed, obtaining a registration control amount based on data which are acquired since the start of said registration control amount establish step until the interruption, without re-executing said registration control amount establish step,

said second step is a correction step of correcting transfer start positions for toner images in said respective toner colors based on said registration control amount which is obtained through said registration control amount establish step or at said fourth step.

Claim 100 (Currently Amended): An image forming method which repeats image create/transfer processing, which is serial processing of forming a toner image on a photosensitive member while rotating said photosensitive member and a transfer medium in a sub scanning direction and thereafter transferring said toner image onto said transfer medium, for a plurality of toner colors which are different from each other, to thereby lay toner images in said respective toner colors over each other on said transfer medium and accordingly form a color image, said image forming method comprising:

a first step of identifying a registration control amount which is necessary to correct relative registration deviations among toner images on said transfer medium;

a second step of correcting transfer start positions of toner images in at least one or more toner colors out of said plurality of toner colors based on said registration control amount;

said first step is a registration control amount establish step of identifying a registration control amount which is necessary to correct relative registration deviations among toner images on said transfer medium which are created as abutting means temporarily contacts said transfer medium while said image create/transfer processing is repeated;

a third step of storing a recovery control amount in memory means; and

a fourth step of, as an interruption of said registration control amount establish step is removed, reading said recovery control amount from said memory means as a registration control amount, without re-executing said registration control amount establish step,

wherein said second step is a correction step of correcting transfer start positions for toner images in said respective toner colors based on said registration control amount which is obtained through said registration control amount establish step or at said fourth step.

101. An image forming method in accordance with Claim 91, further comprising an eighth step of changing a registration control amount when necessary.

102. An image forming method in accordance with Claim 91, further comprising a ninth step of causing said abutting means to temporarily contact said transfer medium while said transfer medium idly rotates at least one or more times between first processing which is said image create/transfer processing in the last toner color and second processing which is said image create/transfer processing for the next toner image,

wherein it is possible to select said second and said ninth steps, and said abutting means is controlled to contact or move away from said transfer medium at the selected step.

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~~101~~ (New): An image forming apparatus which repeats image create/transfer processing, which is serial-processing of forming a toner image on a photosensitive member while rotating said photosensitive member and a transfer medium in a sub scanning direction and thereafter transferring said toner image onto said transfer medium, for a plurality of toner colors which are different from each other, to thereby lay toner images in said respective toner colors over each other on said transfer medium and accordingly form a color image, characterized in correcting transfer start positions of toner images in at least one or more toner colors out of said plurality of toner colors based on a registration control amount

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which is necessary to correct relative registration deviations among toner images on said transfer medium, and comprising:

abutting means which temporarily contacts said transfer medium while said image create/transfer processing is repeated;

memory means which stores as said registration control amount a registration control amount which is necessary to correct relative registration deviations among toner images on said transfer medium which are created because of contact and separation from said transfer medium; and

control means which reads said registration control amount from said memory means and corrects transfer start positions for toner images based on said registration control amount,

wherein after forming a color image at least once or more times based on said registration control amount, said control means corrects said registration control amount based on information regarding said color image formation.

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102(New): An image forming method which repeats image create/transfer processing, which is serial processing of forming a toner image on a photosensitive member while rotating said photosensitive member and a transfer medium in a sub scanning direction and thereafter transferring said toner image onto said transfer medium, for a plurality of toner colors which are different from each other, to thereby lay toner images in said respective toner colors over each other on said transfer medium and accordingly form a color image, said image forming method comprising:

a first step of storing a registration control amount, which is necessary to correct relative registration deviations among toner images on said transfer medium, in memory, means;

a second step of correcting transfer start positions of toner images in at least one or more toner colors out of said plurality of toner colors based on said registration control amount; and

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a third step of, after forming a color image at least once or more times based on said registration control amount, correcting said registration control amount based on information regarding said color image formation.